REMARKS

Status of the Claims

Upon entry of the amendments presented herein, claims 24-28, 30-32, 34, 37-40, 43, 44, 46, 47, 49, 50, and 75 are pending. Claims 24, 25, 28, 32, 34, 40, 44, and 47 are amended, claim 75 is new, and claims 29, 33, 35, 36, 41, 42, 45, 48, and 51-74 are cancelled. Claims 1-23 were previously cancelled in the amendment filed on March 25, 2011.

Support for claims 24-28, 30-32, 34, 37-40, 43, 44, 46, 47, 49, 50, and 75 can be found throughout the specification as originally filed. For example, support for new claims 24-27, can be found at least at paragraphs [0008], [0013], [0011] and [0028] of US 2006/0177869, which is the corresponding U.S. publication for the instant application. Support for new claim 28 can be found at paragraph [0123] of US 2006/0177869. Support for new claims 30-32, 34, and 40 can be found at least at paragraphs [0011], [0016], [0119]-[0120], [0125], [0128], and [0131] of US 2006/0177869. Support for new claim 37 can be found at least in paragraphs [0007] and [0103] of US 2006/0177869. Support for new claims 38 and 39 can be found at least in paragraph [0103] of US 2006/0177869. Support for new claims 43 and 44 can be found at least in paragraphs [0008], [0027], [0029], [0032], [0125], and [0128] of US 2006/0177869. Support for new claims 46 and 47 can be found at least in paragraphs [0006], [0013] and [0014] of US 2006/0177869. Support for new claims 49 and 50 can be found at least in paragraph [0012] of US 2006/0177869. Support for new claim 75 can be found at least in paragraph [0032] of US 2006/0177869. No new matter has been added.

Excess Claims Fees

In accordance with the Notice Requiring Excess Claims Fees mailed on April 12, 2011 in the above-referenced application, Applicants present herein an amendment in compliance with 37 C.F.R. 1.121 that cancels the excess claims that were filed on March 25, 2011. The amended claim set presented herein contains only 1 independent claim and 20 total claims. As such, the requirement for excess claims fees has been rendered moot.

Outstanding Rejection under 35 U.S.C. 103 - Borkholder

Pending claims 24-28, 30-32, 34, 37-40, 43, 44, 46, 47, 49, 50, and 75 presented herein are patentable over U.S. Patent No. 6,377,057 to Borkholder (hereinafter "Borkholder").

Applicants note that claim 24 is the only independent claim pending. Claim 24 recites a system for characterizing physiological activity that includes, in part, a sensor array that detects a plurality of features indicative of physiological activity of a biological sample and produces signals representative of said features, and a processor configured to derive a vector quantity from the signals. The vector quantity includes a number of dimensions equal to a number of different features derived from the signal output of the sensor array.

Borkholder fails to describe a system that produces a *multi-dimensional* vector quantity that corresponds to a plurality of features indicative of physiological activity in a biological sample, as recited in independent claim 24. Rather, Borkholder describes a system that includes a plurality of electrodes for detecting the electrical output of a cellular network and measuring the power spectrum of the electronic signals in response to exposure to a chemical compound. As described in column 5, line 62 to column 6, line 24 of Borkholder, the output signal recording is analyzed using analog or digital methods to generate a Spectral Density Signature ("SDS") for an action potential, such as a Power Spectral Density ("PSD"). The skilled artisan would recognize that PSD shows the strength of the variations (energy) as a function of frequency. In other words, it shows at which frequencies variations are strong and at which frequencies variations are weak.

Borkholder explains that analog techniques can be used for approximating the PSD, for example, by examining the total rms power of an action potential in different frequency bands as an indicator of general shape, rather than peak to peak amplitude. The PSD can also be calculated using digital techniques, such as a Hanning window, fast fourier transform, and complex conjugate. See Borkholder, e.g., column 5, line 62 to column 6, line 24. Thus, while Borkholder describes alternative methods by which PSD can be calculated, it is clear that Borkholder relates to the measurement and characterization of only this <u>single feature</u>.

On page 5 of the Office Action mailed on March 29, 2010, the Examiner asserts that Borkholder teaches that a complete range of frequencies for the action potential is divided into bins for the purpose of calculating PSD, which suggests a multi-dimensional vector quantity. Applicants disagree with the Examiner's characterization. However, even assuming arguendo that the Examiner's assertions are accurate, Borkholder fails to describe the derivation of a multi-dimensional vector quantity, where the different dimensions correspond to a number of *different* features, as recited in independent claim 24.

In contrast to Borkholder, the present invention enables almost any feature that relates to physiological activity of cells to be included in the vector quantity. Moreover, the derivation of such vector quantities enables three-dimensional clustering analysis (see e.g.,

Figure 8), thereby providing a more accurate and reliable cell characterization than the system and methods of Borkholder.

For the foregoing reasons, Applicants submit independent claim 24, and the claims which depend therefrom are patentable over Borkholder.

Conclusion

Applicants submit the pending claims are in condition for allowance. Should there be any questions, the Examiner is encouraged to contact the undersigned at the number or email address listed below.

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Respectfully submitted,
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